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Research Article

Benzo[4',5']imidazo[2',1':6,1]pyrido[2,3-d] pyrimidines: Past and Present

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Article Information

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Summary

Synthetic approaches to the construction of the heterocyclic benzo[4',5']imidazo[2',1':6,1]pyrido[2,3-d]pyrimidine system based on heterocyclizations of substituted benzimidazoles and a new alternative strategy based on 2,4,6-trisubstituted pyrimidinyl-5-propanoic acids are considered. The latter method has been shown to be a successful addition to previously described methods, since it allows one to bypass the significant limitations associated with the use of substituted benzimidazoles and allows the introduction of functional substituents at different positions of the heterocycle that are inaccessible by other methods. The available information on derivatives of this heterocyclic system and their biological properties is summarized.

Introduction

The development of synthetic methods for the construction of polycyclic azaheterocycles is the focus of modern research in the chemistry of heterocyclic compounds. The role of heterocyclic compounds, in particular nitrogen-containing heterocycles, in modern medical and pharmacological chemistry as a reliable structural basis for the search for new effective drugs is especially noticeable [1-3]. It is known that currently more than 90% of new drugs are heterocycles, and the study of the mechanism of action of drugs, in turn, makes it possible to elucidate the molecular mechanisms of specific biochemical processes, making the connection between the organic chemistry of heterocycles, bioorganic chemistry and biochemistry reciprocal.

It is worth noting the importance of the most common azaheterocycles in nature, such as pyrimidines and condensed pyrimidines (purines, pteridines), pyridines, benzimidazoles, which are essential components of all living organisms as nucleic acid bases, coenzymes, mediators of intracellular signals, storage devices and carriers of high-energy phosphates, etc. It is not surprising that synthetic nitrogen-containing heterocycles, which are structural analogues of biologically active natural compounds, are considered as privileged structures in the synthesis of physiologically Active compounds.

Moreover, annulation of various heterocycles leads to polycondensed compounds with a planar structure and a unique electronic circuit, which combine the structural motifs of various pharmacophores in one molecule, which allows us to expect new interesting physicochemical and biological properties